

IN THE CLAIMS

Please amend the claims under 37 C.F.R. § 1.121(c) as set forth below.

1. (Currently amended) A ~~method~~ system for monitoring enantiomeric excess of a plurality of chiral molecules participating in a chemical reaction comprising:
a means for obtaining a plurality of Fourier transform vibrational circular dichroism spectra and Fourier transform absorption spectra in the mid infrared region of a chemical solution when a chemical reaction is occurring in said chemical solution; a means for ordering said plurality of Fourier transform vibrational circular dichroism and absorption spectra as a function of time of collection of spectra; a means for analyzing said Fourier transform vibrational circular dichroism spectra and absorption to determine simultaneously the concentration and enantiomeric excess of each chiral molecule as a function of time.

2. (Currently amended) A ~~method~~ system for monitoring enantiomeric excess of a plurality of chiral molecules participating in a chemical reaction comprising:

a means for obtaining a plurality of Fourier transform vibrational circular dichroism spectra and Fourier transform absorption spectra in the near infrared region of a chemical solution when a chemical reaction is occurring in said chemical solution; a means for ordering said plurality of Fourier transform vibrational circular dichroism and

absorption spectra as a function of time of collection of spectra; a means for analyzing said Fourier transform vibrational circular dichroism spectra and absorption to determine simultaneously the concentration and enantiomeric excess of each chiral molecule as a function of time.

3. (Currently amended) A ~~method~~ system as claimed in claim 1 wherein said chemical solution is monitored by means of a flow cell.

4. (Currently amended) A ~~method~~ system as claimed in claim 2 wherein said chemical solution is monitored by means of a flow cell.

5. (Currently amended) A ~~method~~ system as claimed in claim 1 wherein said chemical solution is monitored by means of a fiber-optically-coupled accessory with or without a flow cell.

6. (Currently amended) A ~~method~~ system as claimed in claim 2 wherein said chemical solution is monitored by means of a fiber-optically-coupled accessory with or without a flow cell.

7. (Currently amended) A method for determining the enantiomeric excess of chiral molecule in a solution having a plurality of molecular species including:

obtaining a concentration coefficient from an IR spectrum for each molecular species in the solution;

obtaining the apparent concentration coefficient of the VCD spectrum for each molecular species in the solution, wherein the steps of obtaining an IR spectrum, and/or coefficients, and obtaining a VCD spectrum, and/or coefficients are performed simultaneously;

for each molecular species present in the solution, dividing the apparent concentration coefficient of the VCD spectrum by the concentration coefficient from IR spectrum to obtain a %EE for each molecular species.

8. (Canceled).

9. (Original) The method for monitoring the enantiomeric excess of molecules in a reaction chamber, including:

providing a reaction chamber to contain the molecules;

providing an instrument for producing both an IR spectrum and a VCD spectrum of the molecules in the reaction chamber;

using the instrument to obtain an IR spectrum and the VCD spectrum of the molecules in the reaction chamber;

obtaining the concentration coefficients of each species from the IR spectrum and the apparent coefficients of each species from the VCD spectrum;

dividing the apparent concentration coefficient of each species present in

the VCD spectrum by the corresponding concentration coefficient of each species in the IR spectrum,

thereby obtain the %EE VCD of each species present in the reaction chamber during the course of the reaction.

10. (Original) The method of claim 9, further including providing a fiberoptic pathway between the reaction chamber and the instrument.

11. (Original) The method of claim 9, further including providing concentration coefficients from the IR spectrum and apparent concentration coefficients of the VCD spectrum of a molecule of interest and the step of determining the %EE of a molecule of interest by dividing the VCD and IR concentration coefficients.

12. (Original) The method of claim 11, further including using a partial least squares analysis to determine the concentration coefficients of the IR spectrum and the apparent concentration coefficients of the VCD spectrum by comparison to the IR spectrum and the VCD spectrum of the molecule at known concentrations.

13. (Original) The method of claim 10, further including a flow cell connected to the reaction chamber and positioning the instrument for producing both the IR spectrum and the VCD spectrum in proximity to the flow cell, so that the spectra are produced by sampling the molecules in the flow cell.

14. (Original) The method of claim 13, wherein the temperature of the reaction chamber environment is controllable, and wherein the %EE information for a particular molecule of interest is used to control the temperature, pressure or other.

15. (New) The system of claim 10, wherein the fiberoptic pathway between the reaction chamber and the instrument delivers infrared radiation to the reaction chamber prior to linear polarization and circular polarization by the instrument.

16. (New) The system of claim 10, wherein the fiberoptic pathway is disposed after a polarization modulator.

17. (New) A method for determining the enantiomeric excess of chiral molecule in a solution including:

obtaining a VCD spectrum for the solution;

performing a partial least squares analysis on the VCD spectrum;

determining a %EE based solely on the VCD spectrum, without obtaining an IR spectrum for the solution.